

Appln No. 10/679,820

Amdt date March 23, 2006

Reply to Office action of September 20, 2005 and January 27, 2006

drain with a pressure less than that in the duct. Claim 32 further recites that the drain is on a floor of the duct and is at least partly shielded with a perforated sheet or screen. Claim 33 adds the limitation of a dam across a portion of the air flow through the duct and adjacent to the drain.

As previously pointed out, the Graemiger patent concerns a centrifugal compressor for a vapor, such as steam, rather than a gas turbine compressor. Thus, there is no air flowing through the compressor inlet duct, only water vapor and possibly liquid water (although that is doubtful). In the Graemiger compressor, there is an inlet duct 1 leading to four stages of compression from which the compressed vapor exits at 6. Liquid accumulates in the bottom of the chambers between the compression stages and can flow upstream (relative to vapor flow) toward the first chamber 25. Liquid water is then drawn from the first stage chamber 25 through a drain 26.

There is no perforated sheet or screen shielding the floor of the inlet duct 1 even if it is considered to include the first stage chamber 25. The only thing resembling such a screen is number 30 in FIGS. 4 and 5 of Graemiger, and this is in chamber 23, which is after the first stage of compression and is not an inlet duct. Nowhere is there any suggestion that the screen should be placed anywhere else, let alone for shielding the floor of the air inlet duct adjacent to the drain.

Claim 33 recites placing a dam across a portion of the air flow through the duct and adjacent to the drain. The only thing resembling a dam in the Graemiger reference is a piece of angle iron "baffle plate" 29 located after the third stage of compression in the chamber 19. This is near the place where water is introduced and is quite inconsistent with placing a dam near the drain 26. The Examiner has characterized the baffle plate as a "dam"

The Examiner alleges that it would have been obvious to place the "dam" 29 and perforated strip 30 into the air inlet duct for the alleged "benefits" of these elements in their present locations. This would be contrary to the teachings of Graemiger. The baffle plate 29 in Graemiger is upstream from the final runner wheel 5 "to prevent the water on entering the space 19 through channel 18 from squirting too high and from getting admixed to the steam in the

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shape of drops of water whereby the runner wheel 5 would have to deal not only with steam but also with water." This is apparently of concern only with the last stage of the compressor since no comparable baffle plate is located in the chamber 21 to avoid splashing of water going through the passage from chamber 19 to 21. There would be even less need for a baffle plate as one goes further upstream since there is less concern about water further from the compressor outlet. Furthermore, it should be noted that in applicant's compressor there is no countercurrent flow of liquid water in the inlet air. This is emphasized in the claim by reciting that the water is flowing along a wall of the duct in the general direction of air flow. Thus, the alleged "benefit" of preventing splashing of water in countercurrent flow would not be of any significance. For such reasons, applicant submits that claim 32 should be allowed.

Similarly, it can be noted that the Graemiger patent finds any importance for a screen 30 only after a first stage of compression in the chamber 23. According to Graemiger, the screen is placed above the water in the space 23 to prevent "too great an evaporation and splashing of the water." This may be of concern in a steam compressor, however, in the air inlet duct of applicant's compressor, evaporation of water is a principal aim and purpose of the air inlet duct structure. It is highly desirable in many cases to humidify the air introduced into the compressor of a gas turbine. Thus, a spray of tiny water droplets is introduced into the air inlet duct. Tiny droplets are used to maximize the rate of evaporation for humidifying the air. Thus, the rationale stated by Graemiger for the screen, and the alleged "benefit" mentioned by the examiner, is contrary to a desiderata of the air inlet duct for a compressor.

The other rationale to prevent splashing causes Graemiger to place the screen or sieve in the rotating compressor stage downstream from where the vapor blasts out of the first compression stage. Splashing appears to be of concern in the rotating parts of the compressor as indicated in FIG. 5. It does not mean there is any rationale for a screen or sieve in the stationary inlet duct 1 even if it is considered to include chamber 25. Even Graemiger didn't see a reason to

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put a screen upstream from the compressor. For such reasons, applicant submits that claim 33 is also in condition for allowance.

Prompt action with respect to all of the claims remaining in this application and allowance of the application are respectfully requested.

Respectfully submitted,

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